

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): ~~Method A method~~ for producing a biomimetic membrane (10), which comprises: ~~characterised in that it comprises the following steps:~~

- a) depositing, on at least one of the principal faces of a plate A of a micro-machinable material, a layer B comprising one or several strata each formed of a micro-machinable material,
- b) forming one or several through holes (20) within layer B, each hole having a wall (21) formed of the material(s) of said layer B and a bottom (22) formed of the material of plate A,
- c) depositing, on said layer B, the wall (21) and the bottom (22) of each hole, a layer C of a micro-machinable material, which closely hugs the wall and the bottom of said hole,
- d) eliminating layer C from the underlying face of layer B and, at the centre of each hole, from the underlying face of plate A, while at the same time leaving a residue (23) of layer C on the wall of said hole(s), said residue delimiting a pore (24) in which the wall (25) is formed of the material of layer C and in which the bottom (26) is formed of the material of ~~layer plate A~~, and
- e) liberating at least the part of layer B in which are found one or several pores (24) formed in step d), by the partial or total elimination of plate A.

Claim 2 (Currently Amended): ~~Method The method according to Claim 1, wherein any of the previous claims, characterised in that~~ layer B has a thickness of between around 5 nm and 5  $\mu\text{m}$ .

Claim 3 (Currently Amended): ~~Method~~ The method according to Claim 1 or Claim 2,  
~~wherein claim 1 or claim 2, characterised in that~~ the number of through holes (20) formed  
within layer B, is between 1 single hole and 100 million holes per mm<sup>2</sup> of surface area of  
layer B, ~~and, preferably, between 1 single hole and 20 million holes per mm<sup>2</sup> of surface area~~  
~~of layer B.~~

Claim 4 (Currently Amended): ~~Method~~ The method according to Claim 1, ~~wherein~~  
~~any of the previous claims, characterised in that~~ the through hole(s) (20) formed in layer B  
are substantially cylindrical.

Claim 5 (Currently Amended): ~~Method~~ The method according to Claim 1, ~~wherein~~  
~~any of the previous claims, characterised in that~~ the through hole(s) (20) formed in layer B  
are formed by a lithography followed by an etching, preferably dry etching.

Claim 6 (Currently Amended): ~~Method~~ The method according to Claim 1, ~~wherein~~  
~~any of the previous claims, characterised in that step b) step d)~~ comprises an anisotropic  
etching of layer C.

Claim 7 (Currently Amended): ~~Method~~ The method according to Claim 6, ~~wherein~~  
~~claim 6, characterised in that~~ the anisotropic etching of layer C is a reactive ion etching.

Claim 8 (Currently Amended): ~~Method~~ The method according to Claim 1, ~~wherein~~  
~~any of the previous claims, characterised in that step e)~~ comprises the total elimination of  
plate A.

Claim 9 (Currently Amended): ~~Method~~ The method according to Claim 1, wherein ~~any of claims 1 to 7, characterised in that~~ step e) comprises the following steps: e<sub>1</sub>) fastening, on the free face of layer B, a plate A' of a micro-machinable material, and e<sub>2</sub>) hollowing out plates A and A' so as to liberate the part of layer B in which are found the pore(s), while at the same time leaving the edges of said plates as well as a part of their face opposite to that situated in contact with said layer B.

Claim 10 (Currently Amended): ~~Method~~ The method according to Claim 9, wherein ~~claim 9, characterised in that~~ plates A and A' are formed of the same material and are covered, on their face opposite to that situated in contact with layer B, with a layer D or micro-machinable material.

Claim 11 (Currently Amended): ~~Method~~ The method according to Claim 9 or Claim 10, wherein ~~claim 9 or 10, characterised in that~~ step e<sub>2</sub>) comprises: a lithography followed by a wet or dry etching to partially eliminate layers D, a wet etching to hollow out plates A and A' while at the same time leaving a residue of said plates which covers layer B, and a dry etching to liberate the part of layer B in which are found one or several pores.

Claim 12 (Currently Amended): ~~Method~~ The method according to Claim 1, wherein ~~any of the previous claims, characterised in that~~ layer B comprises a single stratum and in that said stratum is formed of a micro-machinable material different to that forming layer C.

Claim 13 (Currently Amended): ~~Method~~ The method according to Claim 1, wherein ~~any of claims 1 to 11, characterised in that~~ layer B comprises two strata and in that said strata

are formed of two micro-machinable materials different to each other and different to that forming layer C.

Claim 14 (Currently Amended): ~~Method~~ The method according to Claim 1, wherein ~~any of the previous claims, characterised in that~~ the micro-machinable materials forming plates A and A', layer B and layer C are ~~chosen from among selected from the group consisting of~~ silicon, polycrystalline silicon, silica, silicon oxide and silicon nitride.

Claim 15 (Currently Amended): ~~Method~~ The method according to Claim 1, wherein ~~any of the previous claims, characterised in that~~ it comprises, after step e), a step of functionalising the wall of the pore(s) (24) and/or the portions of the principal faces of the membrane which are not occupied by said wall.

Claim 16 (Currently Amended): ~~Method~~ The method according to Claim 15, wherein ~~claim 15, characterised in that~~ the functionalising step comprises a functionalisation of the wall of the pore(s) (24) and a functionalisation of the portions of the principal faces of the membrane which are not occupied by said wall, said functionalisations being different to each other.

Claim 17 (Withdrawn; Currently Amended): ~~Biomimetic~~ A biomimetic membrane (10) with one or several through pores (24), ~~characterised in that it is formed of comprising at least two different micro-machinable materials, one of which forms the wall (23) of said pore(s), whereas the other material(s) form the remainder of said membrane.~~

Claim 18 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 17, having claim 17, characterised in that it has a surface area of between around 1  $\mu\text{m}^2$  and 1  $\text{cm}^2$ .

Claim 19 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to claim 17 or claim 18, characterised in that it has a thickness of between around 5 nm and 5  $\mu\text{m}$ .

Claim 20 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 17, having any of claims 17 to 19, characterised in that it has only one pore or a plurality of pores that may reach 100 million pores per  $\text{mm}^2$  of surface area, and, preferably, from 1 single pore to 20 million pores per  $\text{mm}^2$  of surface area.

Claim 21 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 17, wherein any of claims 17 to 20, characterised in that the pore(s) (24) that it comprises are substantially cylindrical and have a diameter of between 5 and 500 nm.

Claim 22 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 17, wherein any of claims 17 to 21, characterised in that it is formed of two or three different micro-machinable materials.

Claim 23 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 17, wherein any of claims 17 to 22, characterised in that the

materials forming it are chosen from among selected from the group consisting of silicon, polycrystalline silicon, silica, silicon oxide and silicon nitride.

Claim 24 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 17, wherein any of claims 17 to 23, characterised in that it is integral with two chambers (26, 27) which are arranged on either side of said membrane, which have a base, a lateral wall and a wall opposite said base, and in which said base is formed of said membrane, whereas their wall opposite said base is provided with an opening (28, 29).

Claim 25 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 24, wherein claim 24, characterised in that the lateral wall of the chambers (26, 27) and the wall of said chambers that is opposite their base are formed of a micro-machinable material.

Claim 26 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to claim 25, characterised in that said micro-machinable material is chosen from among silicon, polycrystalline silicon, silica, silicon oxide and silicon nitride.

Claim 27 (Withdrawn; Currently Amended): ~~Biomimetic~~ The biomimetic membrane (10) according to Claim 17, wherein any of claims 17 to 26, characterised in that the wall of the pore(s) bears chemical and/or biochemical functions different to those borne by the portions of its principal faces which are not occupied by said wall.

Claim 28 (Withdrawn; Currently Amended): ~~Application of a A method for using the~~ biomimetic membrane (10) according to Claim 17, which comprises any of claims 17 to 27 to

performing studies on the dynamic and functional properties of biological membranes.

Claim 29 (Withdrawn; Currently Amended): A method for using the biomimetic membrane (10) according to any of claims 17 to 27 to the manufacture of Claim 17, which comprises:

manufacturing biocatalysis microsystems or the detection  
detecting substances; or  
dosing of substances.

DISCUSSION OF AMENDMENT

Claims 1-29 are pending.

Claims 17-29 have been withdrawn from consideration.

Claims 1-29 are amended in order to improve readability and to remove improper multiple dependent claim language.

Claim 6 is amended in order to overcome the outstanding claim objection. In particular, Claim 6 is amended so as to specify that in step d) comprises an anisotropic etching of layer C.

No new matter is believed to be added upon entry of the amendment.

Upon entry of the amendment Claims 1-29 are pending, while Claims 1-16 are under consideration.